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Vegetation survey of high Arctic lichens on Austre Brøggerbreen glacier foreland, Svalbard archipelago in 1994

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The species composition, dominant and indicator species of high Arctic lichens, especially relationship between the vegetation of lichens and landform division and/or ground surface structure has not been investigated in detail on high Arctic glacier foreland at Ny-Ålesund on Spitsbergen Island Svalbard archipelago. Our previous study of vegetation survey indicated that the fruticose lichen *Cetrariella delisei* and the crustose lichen *Ochrolechia frigida* dominated in evenly across the study area. The statistical survey indicated among the four landform division (Upland, Slope, and Lowland zone) and ground surface structure (Gravel/boulder zone), thirteen indicator species were found for the Upland and Gravel/boulder zones. In particular, blue-green algal lichens, which generally prefer semi-wet to wet ground, we might that Gravel/boulder can generate spots of shadow, which might create a semi-wet to wet environment in this area. The Upland zone comprises different water and/or chemical environments including substrate differences, and the *Cetraria* genus is found in this zone. By generating various ground surface structure and landform division affect the distribution of lichens and their growth. This study clearly shows the details of the species composition; relation between indicator species and of high Arctic lichens and land division by hierarchical cluster analysis on high Arctic glacier forelands.